REMARKS/ARGUMENTS

Claims 1-17 are pending herein. Claim 1 has been amended as supported by Figs. 1(a)-(d) of the present application, for example. Claim 2 has been amended in light of the amendments made to claim 1. Claim 3 has been amended to address matters of form. Claim 4 has been amended as supported by Figs. 2(a)-(c) of the present application, for example. Claim 5 has been amended as supported by Figs. 3(a)-(c) of the present application, for example. Claim 6 has been amended to address matters of form. Claim 7 has been amended as supported by Figs. 4(a)-(d) of the present application, for example. Claims 8 and 9 have been amended in light of the amendments made to claim 7. Claim 10 has been amended as supported by Figs. 9(a)-(e) of the present application, for example. Claim 11 has been amended as supported by Figs. 8(a)-(b) of the present application, for example. Claim 12 has been amended in light of the amendments made to claim 11. Claims 13-17 stand withdrawn.

1. Claims 1-12 were rejected under §102(b) over Takeuchi. To the extent that this rejection may be applied against the amended claims, it is respectfully traversed.

Amended claims 1 and 4 recite, in relevant part, a one-dimensional piezoelectric actuator array comprising a piezoelectric device substrate and a guide substrate. The piezoelectric device substrate has a plurality of comb teeth arranged in a one-dimensional matrix and connected to one another at a first end of the piezoelectric device substrate. At least one of the comb teeth is one of a plate-shaped piezoelectric member and a pillar-shaped piezoelectric member having at least one pair of electrodes formed thereon. The one-dimensional matrix forms a plane extending along a length of the comb teeth from the first end of the piezoelectric device substrate to an opposite end thereof and contacting each of the plurality of comb teeth. A guide substrate has a concave portion for housing at least a part of the piezoelectric device substrate, the concave portion extending parallel to the plane of the one-dimensional matrix.

The device of Takeuchi, as shown in Fig. 1, does not include a guide substrate.

Takeuchi discloses, in Fig. 8d, a piezoelectric device substrate having a plurality of comb teeth including electrodes. The one-dimensional matrix shown in Fig. 8d of Takeuchi forms a plane extending along the length of the comb-teeth and contacting each of the plurality of comb teeth lays in the x-y plane, as depicted. Takeuchi does not disclose or suggest the inclusion of a guide substrate having a concave portion extending parallel to the x-y plane.

For at least the foregoing reasons, Takeuchi fails to disclose a guide substrate having a concave portion for housing at least a part of the piezoelectric device substrate, the concave portion extending parallel to the plane of the one-dimensional matrix, as recited in claims 1 and 4. Since claims 2 and 3 depend either directly or indirectly from claim 1, and claims 5 and 6 depend either directly or indirectly from claim 4, those claims are also believed to be allowable over the applied prior art.

Claim 7 recites a two-dimensional piezoelectric actuator array comprising a plurality of piezoelectric device substrates and a first guide frame member. Each of the piezoelectric device substrates has a plurality of comb teeth connected to one another at one end of the piezoelectric device substrate, at least one of the comb teeth being one of a plate-shaped piezoelectric member and a pillar-shaped piezoelectric member having at least one pair of electrodes formed thereon. The first guide frame member is a hollow box shape and has a plurality of pairs of guide grooves for housing the plurality of piezoelectric device substrates. The grooves are formed on two opposed inner surfaces of the guide frame member and the guide grooves are arranged in pairs at an interval corresponding to a thickness of the piezoelectric device substrate. The plurality of piezoelectric device substrates are inserted and housed in the guide grooves of the first guide frame member such that each piezoelectric device substrate is aligned in a corresponding pair of the guide grooves. The plurality of piezoelectric members remain movable within the guide frame member throughout a portion of the piezoelectric members having the pair of electrodes formed thereon.

Takeuchi discloses, in Fig. 8(f), what appears to be a single piezoelectric device substrate having a plurality of comb teeth 31 connected to one another at one end of

the piezoelectric device substrate. None of the embodiments of Takeuchi include a guide frame member of a hollow box shape and having a plurality of pairs of guide grooves for housing the plurality of piezoelectric device substrates 31. All of the embodiments of Takeuchi disclose free standing piezoelectric devices such as those shown in Fig. 8(f).

For at least the foregoing reasons, Takeuchi fails to disclose a first guide frame member of a hollow box shape and having a plurality of pairs of guide grooves for housing a plurality of piezoelectric device substrates, the guide grooves being formed on two opposed inner surfaces of the guide frame member, as recited in claim 7. Furthermore, Takeuchi fails to disclose or suggest a device wherein the plurality of piezoelectric device substrates are inserted and housed in the guide grooves in the first guide frame member such that the plurality of the piezoelectric members remain movable within the guide frame member throughout a portion of the piezoelectric members having the pair of electrodes formed thereon, as recited in claim 7. Since claims 8 and 9 depend either directly or indirectly from claim 7, those claims are also believed to be allowable over the applied prior art.

Amended claim 10 recites a one-dimensional piezoelectric actuator array comprising a plurality of piezoelectric devices arranged in a one-dimensional matrix in an independently separated state, and a guide substrate. The one-dimensional matrix of piezoelectric devices form a plane extending along a longitudinal length of the piezoelectric devices and contacting each of the plurality of piezoelectric devices. The guide substrate has a concave portion for housing at least a part of each of the plurality of piezoelectric devices, the concave portion extending parallel to the plane of the one-dimensional matrix.

Takeuchi fails to disclose or suggest the features recited in claim 10. All of the embodiments of Takeuchi appear to disclose the creation of piezoelectric actuator arrays with the individual piezoelectric devices formed integrally as a piezoelectric device substrate (see Figs. 8(a)-(f)). As discussed in further detail above, Takeuchi also fails to disclose or suggest the addition of a guide substrate.

For at least the foregoing reasons, Takeuchi fails to disclose or suggest a plurality of piezoelectric devices arranged in a one-dimensional matrix in an independently separated state. Additionally, Takeuchi fails to disclose or suggest a guide substrate having a concave portion for housing at least a part of each of the plurality of piezoelectric devices, the concave portion extending parallel to the plane of the one-dimensional matrix, as recited in claim 10.

Amended claim 11 recites a two-dimensionally aligned piezoelectric actuator array comprising a plurality of piezoelectric devices and a second guide frame member. Each piezoelectric device comprises at least one of a plate-shaped piezoelectric member and a pillar-shaped piezoelectric member. The second guide frame member has a plurality of openings arranged in a grid form, and a housing space is channeled through the plurality of openings. The piezoelectric devices are fixed within the second guide frame member by inserting each of the plurality of piezoelectric devices into corresponding openings of the housing space of the second guide frame member. The plurality of piezoelectric devices remain movable within the second guide frame member throughout a portion of the piezoelectric devices having the pair of electrodes formed thereon.

Takeuchi does not disclose or suggest in any embodiment contained therein, the use of a second guide frame member having a plurality of openings through which piezoelectric devices are inserted. All of the devices of Takeuchi disclose piezoelectric devices extending from a base surface with the individual piezoelectric devices arranged side by side and not extending through individual openings.

For at least the foregoing reasons, Takeuchi fails to disclose a second guide frame member having a plurality of openings arranged in a grid form wherein the piezoelectric devices are fixed within the second guide frame member, the plurality of piezoelectric devices remaining movable within the second guide frame member throughout a portion of the piezoelectric devices having the pair of electrodes formed thereon, as recited in claim 11. Since claim 12 depends directly upon claim 11, claim 12 was also believed to be allowable over the applied prior art.

For at least the foregoing reasons, Applicants respectfully submit that all pending claims herein define patentable subject matter over Takeuchi. Accordingly, reconsideration and withdrawal of the present rejection are respectfully requested.

If the Examiner believes that contact with Applicants' attorney would be advantageous toward the disposition of this case, the Examiner is herein requested to call Applicants' attorney at the phone number noted below.

The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 50-1446.

Respectfully submitted,

December 5, 2006
Date

Stephen P. Burr
Reg. No. 32,970

Timothy D. Evans
Reg. No. 50,797

SPB/TE/tlp

BURR & BROWN
P.O. Box 7068
Syracuse, NY 13261-7068

Customer No.: 025191
Telephone: (315) 233-8300
Facsimile: (315) 233-8320